

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Loamy

Site ID: R067BY002CO

Major Land Resource Area: 67B – Central High Plains, Southern Part

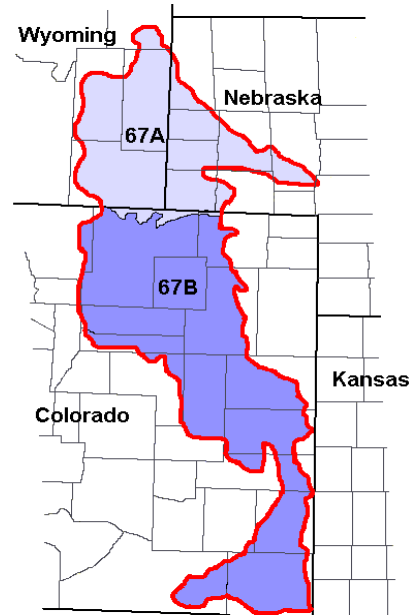
Physiographic Features

This site occurs on nearly level to gently sloping plains.

Landform: plain, terrace

Aspect: N/A

| | <u>Minimum</u> | <u>Maximum</u> |
|------------------------------------|----------------|----------------|
| Elevation (feet): | 3800 | 5600 |
| Slope (percent): | 0 | 6 |
| Water Table Depth (inches): | 60 | 60 |
| Flooding: | | |
| Frequency: | none | none |
| Duration: | none | none |
| Ponding: | | |
| Depth (inches): | 0 | 0 |
| Frequency: | none | none |
| Duration: | none | none |
| Runoff Class: | low | medium |



Climatic Features

The mean average annual precipitation varies from 12 to 16 inches per year depending on location and ranges from less than 8 inches to over 20 inches per year. Approximately 75 percent of the annual precipitation occurs during the growing season from mid-April to late-September. Snowfall can vary greatly from year to year but averages 35 to 45 inches per year. Winds are estimated to average about 9 miles per hour annually, ranging from 10 miles per hour during the spring to 9 miles per hour during late summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring periods of high winds with gusts to more than 90 miles per hour.

The average length of the growing season is 142 days, but varies from 129 to 154 days. The average date of first frost in the fall is September 28, and the last frost in the spring is about May 9. July is the hottest month and December and January are the coldest. It is not uncommon for the temperature to exceed 100 degrees F during the summer. Summer humidity is low and evaporation is high. The winters are characterized with frequent northerly winds, producing severe cold with temperatures dropping to -35 degrees F or lower.

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MLRA: 67B – Central High Plains, Southern Part

Loamy
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Growth of native cool season plants begins about March 15 and continues to about June 15. Native warm season plants begin growth about May 15 and continue to about August 15. Regrowth of cool season plants occurs in September and October of most years, depending on moisture.

| | <u>Minimum</u> | <u>Maximum</u> |
|--|----------------|----------------|
| Frost-free period (days): | 129 | 154 |
| Freeze-free period (days): | 151 | 178 |
| Mean Annual Precipitation (inches): | 12 | 16 |

Average Monthly Precipitation (inches) and Temperature (°F):

| | Precip. Min. | Precip. Max | Temp. Min. | Temp. Max. |
|-----------|--------------|-------------|------------|------------|
| January | 0.32 | 0.36 | 12.0 | 45.1 |
| February | 0.26 | 0.38 | 15.9 | 50.9 |
| March | 0.83 | 0.87 | 22.3 | 58.9 |
| April | 1.28 | 1.38 | 30.1 | 69.1 |
| May | 2.32 | 2.49 | 39.9 | 78.0 |
| June | 1.93 | 2.57 | 49.0 | 88.7 |
| July | 1.42 | 2.31 | 55.0 | 93.9 |
| August | 1.07 | 2.38 | 53.5 | 91.9 |
| September | 1.02 | 1.40 | 43.8 | 83.8 |
| October | 0.89 | 1.00 | 32.5 | 72.9 |
| November | 0.52 | 0.53 | 20.9 | 57.4 |
| December | 0.34 | 0.37 | 11.9 | 46.9 |

| Climate Stations | | Period | |
|-------------------------|-------------------------|---------------|-----------|
| Station ID | Location or Name | From | To |
| CO0945 | Briggsdale | 1948 | 2000 |
| CO4076 | Holly | 1918 | 2000 |
| CO9147 | Windsor | 1948 | 1990 |

For local climate stations that may be more representative, refer to <http://www.wcc.nrcs.usda.gov>.

Influencing Water Features

| Wetland Description: | <u>System</u> | <u>Subsystem</u> | <u>Class</u> | <u>Sub-class</u> |
|-----------------------------|----------------------|-------------------------|---------------------|-------------------------|
| None | None | None | None | None |

Stream Type: None

Representative Soil Features

The soils of this site are typically very deep but may also include moderately deep soils. Typically, they are well drained and are moderately slow or moderately permeable. Typically, these soils formed in loamy loess and eolian deposits derived from mixed calcareous sources. Some soils formed in loamy alluvium derived from mixed calcareous sources. These soils occur on upland plains, and terraces. The available water capacity is typically high for the very deep soils and low to moderate for the moderately deep soils. The soil surface layer ranges from 3 to 16 inches thick and is typically loam or silt loam. The pH of these soils ranges from neutral to moderately alkaline. The soil moisture regime is typically aridic ustic with some ustic aridic in the drier areas. The soil temperature regime is mesic.

The Historic Climax Plant Community (HCPC) should show slight to no evidence of rills, wind scoured areas or pedestaled plants. Water flow paths are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

Major soil series correlated to this ecological site include: Adena, Altvan, Ascalon (loam), Baca (loam), Colby (0-5%), Fort Collins, Harbord, Iliff, Keith, Kimst, Kuma, Norka, Nucla, Nunn (loam), Platner, Rago, Renohill, Richfield, Rosebud, Satanta, Stoneham, Thedalund, Ulmet, Ulysses, Wages, Weld and Wiley.

Other soil series that have been correlated to this site include: none

Parent Material Kind: loess, eolian deposits, alluvium

Parent Material Origin: mixed-calcareous

Surface Texture: loam, silt loam, very fine sandy loam

Surface Texture Modifier: none

Subsurface Texture Group: loamy

Surface Fragments $\leq 3''$ (% Cover): 0

Surface Fragments $> 3''$ (%Cover): 0

Subsurface Fragments $\leq 3''$ (% Volume): 0 - 15

Subsurface Fragments $> 3''$ (% Volume): 0

| | <u>Minimum</u> | <u>Maximum</u> |
|---|----------------|----------------|
| Drainage Class: | well | well |
| Permeability Class: | slow | moderate |
| Depth (inches): | 40 | 80 |
| Electrical Conductivity (mmhos/cm)*: | 0.00 | 2.00 |
| Sodium Absorption Ratio*: | 0 | 0 |
| Soil Reaction (1:1 Water)*: | 6.6 | 8.4 |
| Available Water Capacity (inches)*: | 3 | 8 |
| Calcium Carbonate Equivalent (percent)*: | 0 | 15 |

*These attributes represent 0-40 inches in depth or to the first restrictive layer.

Plant Communities

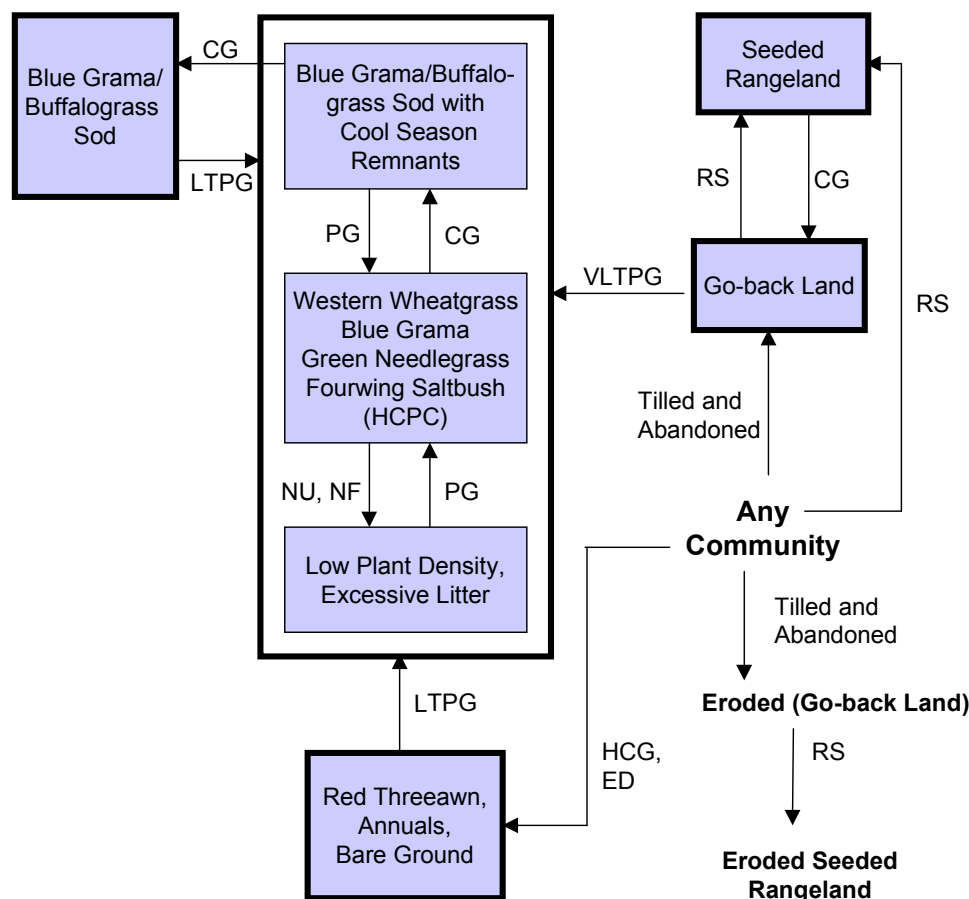
Ecological Dynamics of the Site:

Deterioration of this site, due to continuous grazing without adequate recovery periods following each grazing occurrence, will cause blue grama and buffalograss to increase and eventually form a sod. Cool season grasses such as green needlegrass and western wheatgrass will decrease in frequency and production as well as key shrubs such as fourwing saltbush and winterfat. American vetch and other highly palatable forbs will decrease also. Red threeawn, annuals and bare ground increases under heavy continuous grazing or excessive defoliation. Much of this ecological site has been tilled and used for crop production.

The historic climax plant community (description follows the plant community diagram) has been determined by study of rangeland relic areas, areas protected from excessive disturbance, seasonal use pastures, short duration/time controlled grazing and historical accounts.

The following diagram illustrates the common plant communities that can occur on the site and the transition pathways (arrows) among communities. Bold lines surrounding each plant community or communities represent ecological thresholds. The ecological processes are discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



CG - continuous grazing w/o adequate recovery opportunity, **ED** - excessive defoliation, **HCG** - heavy continuous grazing, **HCPC** - Historic Climax Plant Community, **LTPG** - long term prescribed grazing (>40 yrs), **NF** - no fire, **NU** - non use, **PG** - prescribed grazing with adequate recovery period, **RS** - range seeding, **VLTPG** - very long term prescribed grazing (>80 yrs)

Plant Community Composition and Group Annual Production

| | | | Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing Saltbush (HCPC) | | | |
|--|---|--------|---|------------------|----------------|-------------|
| COMMON/GROUP NAME | SCIENTIFIC NAME | SYMBOL | Group | Lbs./acre | % Comp | |
| GRASSES & GRASS-LIKES | | | | | | |
| COOL SEASON MID RHIZOMATOUS GRASS | | | 1 | 260 - 390 | 20 - 30 | |
| western wheatgrass | Pascopyrum smithii | PASM | 1 | 260 - 390 | 20 - 30 | |
| COOL SEASON MID BUNCH GRASSES | | | 2 | 65 - 195 | 5 - 15 | |
| bottlebrush squirreltail | Elymus elymoides ssp. elymoides | ELELE | 2 | 0 - 13 | 0 - 1 | |
| green needlegrass | Nassella viridula | NAV4 | 2 | 65 - 195 | 5 - 15 | |
| Indian ricegrass | Achnatherum hymenoides | ACHY | 2 | 0 - 13 | 0 - 1 | |
| needleandthread | Hesperostipa comata ssp. comata | HECOC8 | 2 | 0 - 13 | 0 - 1 | |
| WARM SEASON SHORT BUNCH GRASS | | | 3 | 260 - 325 | 20 - 25 | |
| blue grama | Bouteloua gracilis | BOGR2 | 3 | 260 - 325 | 20 - 25 | |
| WARM SEASON SHORT STOLONIFEROUS GRASS | | | 4 | 13 - 65 | 1 - 5 | |
| buffalograss | Buchloe dactyloides | BUDA | 4 | 13 - 65 | 1 - 5 | |
| WARM SEASON MID BUNCH GRASSES | | | 5 | 13 - 33 | 1 - 3 | |
| little bluestem | Schizachyrium scoparium | SCSC | 5 | 0 - 13 | 0 - 1 | |
| sideoats grama | Bouteloua curtipendula | BOCU | 5 | 0 - 13 | 0 - 1 | |
| sand dropseed | Sporobolus cryptandrus | SPCR | 5 | 13 - 39 | 1 - 3 | |
| COOL SEASON ANNUAL GRASSES | | | 6 | 0 - 13 | 0 - 1 | |
| sixweeks fescue | Vulpia octoflora | VUOC | 6 | 0 - 13 | 0 - 1 | |
| MISCELLANEOUS GRASSES | | | 7 | 13 - 22 | 1 - 2 | |
| red threeawn | Aristida purpurea var. longiseta | ARPUL | 7 | 0 - 13 | 0 - 1 | |
| ring muhly | Muhlenbergia torreyi | MUTO2 | 7 | 0 - 13 | 0 - 1 | |
| SEDGES | | | 8 | 13 - 26 | 1 - 2 | |
| sun sedge | Carex inops ssp. heliophila | CAINH2 | 8 | 13 - 26 | 1 - 2 | |
| needleleaf sedge | Carex duriuscula | CADU6 | 8 | 0 - 13 | 0 - 1 | |
| OTHER NATIVE GRASSES | | | 9 | 13 - 39 | 1 - 3 | |
| FORBS | | | | | | |
| LEGUMES | | | 10 | 22 - 77 | 2 - 7 | |
| American vetch | Vicia americana | VIAM | 10 | 13 - 65 | 1 - 5 | |
| purple prairie clover | Dalea purpurea var. purpurea | DAPUP | 10 | 13 - 26 | 1 - 2 | |
| slimflower scurfpea | Psoraleidum tenuiflorum | PSTE5 | 10 | 0 - 13 | 0 - 1 | |
| woolly locoweed | Astragalus mollissimus | ASMO7 | 10 | 0 - 13 | 0 - 1 | |
| silky crazyweed | Oxytropis sericea | OXSE | 10 | 0 - 13 | 0 - 1 | |
| silky sophora | Sophora nuttalliana | SONU | 10 | 0 - 13 | 0 - 1 | |
| COOL SEASON | | | 11 | 22 - 44 | 2 - 4 | |
| scarlet globemallow | Sphaeralcea coccinea | SPCO | 11 | 13 - 39 | 1 - 3 | |
| narrowleaf penstemon | Penstemon angustifolius | PEAN4 | 11 | 13 - 26 | 1 - 2 | |
| variable senecio | Packera neomexicana var. mutabilis | PANEM | 11 | 0 - 13 | 0 - 1 | |
| WARM SEASON | | | 12 | 33 - 77 | 3 - 7 | |
| dotted gayfeather | Liatris punctata | LIPU | 12 | 13 - 26 | 1 - 2 | |
| ironplant goldenweed | Machaeranthera pinnatifida ssp. pinnatifida | MAPIP4 | 12 | 13 - 26 | 1 - 2 | |
| upright prairie coneflower | Ratibida columnifera | RACO3 | 12 | 13 - 26 | 1 - 2 | |
| plains bahia | Picradeniopsis oppsitifolia | PIOP | 12 | 0 - 13 | 0 - 1 | |
| Colorado four o'clock | Mirabilis multiflora | MIMU | 12 | 0 - 13 | 0 - 1 | |
| cutleaf evening-primrose | Oenothera coronopifolia | OECO2 | 12 | 0 - 13 | 0 - 1 | |
| Louisiana sagewort | Artemisia ludoviciana | ARLU | 12 | 0 - 13 | 0 - 1 | |
| rush skeletonplant | Lygodesmia juncea | LYJU | 12 | 0 - 13 | 0 - 1 | |
| scarlet gaura | Gaura coccinea | GACO5 | 12 | 0 - 13 | 0 - 1 | |
| wavyleaf thistle | Cirsium undulatum | CIUN | 12 | 0 - 13 | 0 - 1 | |
| western ragweed | Ambrosia psilostachya | AMPS | 12 | 0 - 13 | 0 - 1 | |
| ANNUALS | | | 13 | 0 - 13 | 0 - 1 | |
| woolly Indianwheat | Plantago patagonica | PLPA2 | 13 | 0 - 13 | 0 - 1 | |
| OTHER NATIVE FORBS | | | 14 | 26 - 65 | 2 - 5 | |
| SHRUBS, HALF-SHRUBS, ETC. | | | | | | |
| SHRUBS | | | 15 | 66 - 260 | 6 - 20 | |
| fourwing saltbush | Atriplex canescens | ATCA2 | 15 | 65 - 195 | 5 - 15 | |
| winterfat | Krascheninnikovia lanata | KRLA2 | 15 | 13 - 65 | 1 - 5 | |
| rubber rabbitbrush | Ericameria nauseosa ssp. nauseosa | ERNAN5 | 15 | 0 - 13 | 0 - 1 | |
| HALF-SHRUBS | | | 16 | 0 - 13 | 0 - 1 | |
| broom snakeweed | Gutierrezia sarothrae | GUSA2 | 16 | 0 - 13 | 0 - 1 | |
| fringed sagebrush | Artemisia frigida | ARFR4 | 16 | 0 - 13 | 0 - 1 | |
| SUCCULENTS | | | 17 | 0 - 13 | 0 - 1 | |
| plains pricklypear | Opuntia polyacantha | OPPO | 17 | 0 - 13 | 0 - 1 | |
| purple pincushion | Escobaria vivipara var. vivipara | ESVIV | 17 | 0 - 13 | 0 - 1 | |
| EVERGREEN | | | 18 | 0 - 13 | 0 - 1 | |
| small soapweed | Yuca glauca | YUGL | 18 | 0 - 13 | 0 - 1 | |
| OTHER NATIVE SHRUBS | | | 19 | 13 - 39 | 1 - 3 | |
| Annual Production lbs./acre | | | | LOW | RV* | HIGH |
| GRASSES & GRASS-LIKES | | | | 415 - | 1007 - | 1400 |
| FORBS | | | | 60 - | 130 - | 200 |
| SHRUBS | | | | 125 - | 163 - | 200 |
| TOTAL | | | | 600 - | 1300 - | 1800 |

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. *RV - Representative Value

Plant Community Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they probably are the most prevalent and repeatable plant communities. The plant composition table shown above has been developed from the best available knowledge at the time of this revision. As more data are collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as “Desired Plant Communities”. According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing Saltbush Plant Community

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This plant community evolved with grazing by large herbivores, is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing that allows for adequate recovery periods following each grazing event. The potential vegetation is about 70-85% grasses and grass-like plants, 5-15% forbs and 10-15% woody plants.

The major grasses include western wheatgrass, green needlegrass and blue grama. Sub-dominant grasses include needleandthread, buffalograss and sand dropseed. Major forbs and shrubs include American vetch, upright prairie coneflower, scarlet globemallow, dotted gayfeather, fourwing saltbush and winterfat.

This plant community is diverse, stable, and productive. Litter is properly distributed with very little movement off-site and natural plant mortality is very low. It is well suited to carbon sequestration, water yield, wildlife use by many species, livestock use and is esthetically pleasing. Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. This community is resistant to many disturbances except continuous grazing, tillage and/or development into urban or other uses.

Total annual production ranges from 600 to 1800 pounds of air-dry vegetation per acre and will average 1300 pounds during an average year.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6701

Growth curve name: Cool season/warm season co-dominant; MLRA-67B; upland fine textured soils.

| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 0 | 2 | 8 | 20 | 28 | 15 | 12 | 10 | 5 | 0 | 0 |

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Continuous grazing without adequate recovery periods between grazing events will shift this plant community to the *Blue Grama/Buffalograss Sod with Cool Season Remnants Plant Community*.
- Non-use (rest) and lack of fire will move this plant community to the *Low Plant Density, Excessive Litter Plant Community*.

- Prescribed grazing that allows for adequate recovery opportunity following each grazing event and proper stocking will maintain the *Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing Saltbush Plant Community (HCPC)*.

Blue Grama/Buffalograss Sod with Cool Season Remnants Plant Community

This plant community evolved with long-term continuous grazing, moderate stocking, and in some instances heavy winter stocking. Recognition of this plant community will enable the land user to implement key management decisions before a significant economic/ecological threshold is crossed.

Key species such as green needlegrass, western wheatgrass, American vetch, fourwing saltbush and winterfat have been reduced to remnant amounts. Blue grama and buffalograss have increased in abundance, dominate the community, and are beginning to take on a sod appearance. Sand dropseed, red threeawn, sixweeks fescue, plains pricklypear, hairy goldaster and bottlebrush squirreltail have also increased. This plant community is at risk of losing western wheatgrass, which is the major cool season grass left at this point. Once the key species are completely removed and other plants have increased, it will take a long time to bring them back by management alone. Substantial increases in money and other resources will be required to replace the lost species in a shorter period of time.

Total aboveground carbon has been reduced due to decreases in forage and litter production. Reduction of rhizomatous wheatgrass, nitrogen fixing forbs, shrub component and increased warm season short grasses has begun to alter the biotic integrity of this community. Water and nutrient cycles may be impaired.

Total annual production can vary from 200 to 900 pounds of air-dry vegetation per acre and will average 700 pounds during an average year.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6702

Growth curve name: Warm season dominant, cool season sub-dominant; MLRA-67B, upland fine textured soils.

| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 0 | 0 | 2 | 15 | 45 | 20 | 15 | 3 | 0 | 0 | 0 |

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Continuous grazing without adequate recovery periods between grazing events shifts this plant community across an ecological threshold toward the *Blue Grama/Buffalograss Sod Plant Community*.
- Prescribed grazing with adequate recovery periods after each grazing occurrence during the growing season with a proper stocking rate will return the plant community back to the *Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing Saltbush Plant Community (HCPC)*.

Low Plant Density, Excessive Litter Plant Community

This plant community occurs when grazing is removed for long periods of time (rest) in the absence of fire. Plant composition is similar to the HCPC, however individual species production and frequency will be lower. Prickley pear cactus and fringed sagebrush have increased.

Much of the nutrients are tied up in excessive litter. The semiarid environment and the absence of animal traffic to break down litter slow nutrient recycling. Aboveground litter also limits sunlight from reaching plant crowns. Many plants, especially bunchgrasses die off. Thick litter and absence of grazing or fire reduce seed germination and establishment.

In advanced stages, plant mortality can increase and erosion may eventually occur if bare ground increases. Once this happens it will require increased energy input in terms of practice cost and management to bring back.

Total annual production can vary from 400 to 1300 pounds of air-dry vegetation per acre and will average 850 pounds during an average year.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6703

Growth curve name: Cool season/warm season co-dominant, excess litter; MLRA-67B; upland fine textured soils.

| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 0 | 0 | 10 | 20 | 25 | 15 | 15 | 10 | 5 | 0 | 0 |

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Prescribed grazing with adequate recovery periods between each grazing event and proper stocking can restore this plant community back to the *Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing Saltbush Plant Community (HCPC)*.

Blue Grama/Buffalograss Sod Plant Community

This plant community evolved with repeated continuous grazing and occurs frequently throughout most of the eastern plains of Colorado. Fourwing saltbush, winterfat, American vetch and green needlegrass have been removed. Western wheatgrass may persist in trace amounts, greatly reduced in vigor and not readily seen. Blue grama and buffalograss dominate the community with a tight “sodbound” structure. Plains pricklypear, hairy goldaster, red threeawn, sixweeks fescue and bottlebrush squirreltail have increased.

This plant community is resistant to change due to grazing tolerance of buffalograss and blue grama. A significant amount of production and diversity has been lost when compared to the HCPC. Loss of cool season grasses, shrub component and nitrogen fixing forbs have negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly due to the massive shallow root system “root pan”, characteristic of sodbound blue grama and buffalograss. Soil loss may be obvious where flow paths are connected.

It will take a very long time to restore this plant community back to the HCPC with improved management. Renovation would be very costly. Desertification is advanced.

Production ranges from 100 to 800 pounds of air-dry vegetation per acre per year and averages 600 pounds.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6707

Growth curve name: Warm season dominant; MLRA-67B; upland fine textured soils.

| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 0 | 0 | 3 | 20 | 45 | 20 | 10 | 2 | 0 | 0 | 0 |

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Heavy continuous grazing or excessive defoliation without adequate recovery periods following each grazing event will shift this plant community toward the *Red threeawn, Annuals, Bare Ground Plant Community*. This transition may take greater than 40 years. Erosion and loss of organic matter/carbon reserves are concerns.
- Long term prescribed grazing with adequate recovery periods following each grazing event and proper stocking over long periods of time move this plant community toward the *Blue Grama/Buffalograss Sod with Cool Season Remnants Plant Community* and will eventually return to the *HCPC* or associated successional plant community stages assuming an adequate seed/vegetative source is available. This process may take greater than 40 years.

Red Threeawn, Annuals, Bare Ground Plant Community

This plant community develops with heavy continuous grazing and/or occupation by prairie dogs. Red threeawn is the dominant species. Blue grama may persist in localized areas. Introduced annuals such as kochia and Russian thistle are present. Introduced species such as field bindweed can also be present, especially on prairie dog towns.

Litter levels are extremely low. Erosion is evident where flow paths are continuous. Rills may occur on steeper slopes. Wind scoured areas may be apparent on knolls or unprotected areas. The nutrient cycle, water cycle and overall energy flow are greatly impaired. Organic matter/carbon reserves are greatly reduced. This community is not stable. Desertification is obvious.

Total annual production can vary from 50 to 200 pounds of air-dry vegetation per acre and will average 100 pounds during an average year.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6707

Growth curve name: Warm season dominant; MLRA-67B; upland fine textured soils.

| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 0 | 0 | 3 | 20 | 45 | 20 | 10 | 2 | 0 | 0 | 0 |

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Long term prescribed grazing with adequate recovery periods between each grazing event and proper stocking can eventually move this community back to the *Historic Climax Plant Community* or associated successional plant community stages, but it will take a long time (40 to 80 years or more).
- Range seeding followed by prescribed grazing may be used as an alternative to convert this plant community to a *Seeded Rangeland* community, which can closely resemble the *HCPC* however, at a substantial cost.

Go-back Land

Go-back land is created when the soil is tilled or farmed (sodbusted) and abandoned. All of the native plants are destroyed, soil organic matter is reduced, soil structure is changed and a plowpan or compacted layer is formed. Residual synthetic chemicals often remain from past farming operations and erosion processes may be active.

Go-back land evolves through several plant communities beginning with an early annual plant community, which initiates the revegetation process. Plants such as Russian thistle, kochia and other annuals begin to establish. These plants give some protection from erosion and start to build minor levels of soil organic matter. This early annual plant community lasts for two to several years. Red threeawn, sand dropseed and several other early perennials can dominate the plant community for five to eight years or more. Buffalograss establishes next and dominates for many years. Eventually western wheatgrass, blue grama and other natives become reestablished.

Transitions or pathways leading to other plant communities are as follows:

- Very long term prescribed grazing that allows adequate recovery periods following each grazing event and proper stocking will most likely take this plant community to a buffalograss dominated plant community and eventually back to the *HCPC*. This process takes many years (40-80 years or more).
- Range seeding followed with prescribed grazing can be used to convert *Go-back Land* to *Seeded Rangeland* which can resemble the *HCPC*.

Go-back Land (eroded)

Eroded go-back land is created where tillage or farming and severe erosion has occurred. If the parent material that the original soil developed from is lost, then another ecosite will evolve. If the same parent material is present, then re-seeding or the slow process of developing soil and vegetation will start by similar processes as shown in the non-eroded *Go-back Land* above. This is a very slow process (100 years or more).

Seeded Rangeland

This plant community can vary considerably depending on how eroded the soil was, the species seeded, the stand that was established, how long ago the stand was established and the management of the stand since establishment.

- Continuous grazing without adequate recovery period between grazing events can shift this plant community to *Go-back Land*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing Saltbush Plant Community-Historic Climax Plant Community (HCPC) and Blue Grama/Buffalograss Sod, Western Wheatgrass and Shrubs Plant Community

Common bird species expected on these communities include Cassin's sparrow, chestnut collared longspur, lark bunting, western meadowlark, and ferruginous and Swainson's hawks. White-tailed and black-tailed jackrabbit, badger, pronghorn, coyote, swift fox, plains pocket gopher, long-tailed weasel, and several species of mice are mammals that commonly use these plant communities. Reptiles using these communities include western rattlesnake, bullsnake, plains garter snake (if water is in home range), western hognose snake, racer, western box turtle, and six-lined racerunner.

Blue Grama/Buffalograss Sod with Cool Season Remnants Plant Community

The reduction of shrubs and taller grasses in this plant community results in a shift of bird species away from the HCPC birds. Lark bunting, chestnut-collared longspur, and western meadowlark use declines and Cassin's sparrow stop using the community altogether. Habitat conditions are ideal for long-billed curlew. McCown's longspur, burrowing owl, mountain plover, killdeer, and horned lark begin using this community. Ferruginous and Swainson's hawks are frequent users of this community. Most mammals will be the same as in the HCPC, however jackrabbit, black-tailed prairie dog, desert cottontail, and thirteen-lined ground squirrel use will increase because of the changing plant community. Reptiles using this community are the same as in the HCPC.

Low Plant Density, Excessive Litter Plant Community; Blue Grama/Buffalograss Sod Plant Community; Red Threeawn, Annuals, Bare Ground Plant Community; and Go-back Land Plant Community

Burrowing owl, mountain plover, horned lark, McCown's longspur, killdeer, and long-billed curlew use these plant communities. With the exception of the hawk species, no HCPC bird species would frequent these communities. Jackrabbit, black-tailed prairie dog, thirteen-lined ground squirrel, and desert cottontail rabbit are frequent users of these communities. All other mammal species from the HCPC may use the community. Reptiles using these communities exclusively are short-horned lizard and lesser earless lizard. Other reptiles using these communities include the species listed for the HCPC.

Seeded Rangeland

The wildlife species expected on seeded rangeland would be those listed for the plant community the seeding most resembles.

Other Potential Species

The plains spadefoot is the only common species of frog or toad inhabiting grasslands in Eastern Colorado. This species requires water for breeding. Tiger salamanders may be found on grassland sites, but require a water body for breeding. Either of these species may be found in any plant community if seasonal water requirements are met. Mule and white-tailed deer may use this ecological site, however the shrub cover is too low to expect more than occasional use. Big brown bats will use any plant community on this ecological site if a building site is in the area. The gray wolf, black-footed ferret, and wild bison used this ecological site in historic times. The wolf and ferret are thought to be extirpated from Eastern Colorado. Bison are currently found only as domestic livestock.

Animal Preferences (Quarterly – 1,2,3,4[†])

| Common Name | Cattle | Sheep | Horses | Deer | Antelope | Bison | Elk |
|-------------------------------|---------|---------|---------|---------|----------|---------|---------|
| Grasses and Grass-like | | | | | | | |
| blue grama | D P P D | D P P D | D P P D | D P P D | D P P D | D P P D | D P P D |
| bottlebrush squirreltail | U D U U | U D U U | U D U U | U D U U | U D U U | U D U U | U D U U |
| buffalograss | D D P D | D D P D | D D P D | D D P D | D D P D | D D P D | D D P D |
| green needlegrass | U P D D | U P D D | U P D D | U P D D | U P D D | U P D D | U P D D |
| Indian ricegrass | D P D D | D P D D | D P D D | D P D D | D P D D | D P D D | D P D D |
| little bluestem | U D P U | N D D N | U D P U | N D D N | N D D N | U D P U | U D P U |
| needleandthread | U P D D | N D N D | U P D D | N D N D | N D N D | U P D D | U P D D |
| red threeawn | N N N N | N N N N | N N N N | N N N N | N N N N | N N N N | N N N N |
| ring muhly | N N N N | U U U U | N N N N | U U U U | U U U U | N N N N | N N N N |
| sand dropseed | U D U N | N U D N | U D U N | N U D N | N U D N | U D U N | U D U N |
| sideoats grama | U D P U | U D P U | U D P U | U D P U | U D P U | U D P U | U D P U |
| sixweeks fescue | N D N N | N D N N | N D N N | N D N N | N D N N | N D N N | N D N N |
| western wheatgrass | U P D D | U P D D | U P D D | U P D D | U P D D | U P D D | U P D D |
| needleleaf sedge | U P D D | U P D D | U P D D | U P D D | U P D D | U P D D | U P D D |
| sun sedge | U P D D | U P D D | U P D D | U P D D | U P D D | U P D D | U P D D |
| Forbs | | | | | | | |
| American vetch | D P P D | D P P D | D P P D | D P P D | D P P D | D P P D | D P P D |
| Colorado four o'clock | U D D U | D P P U | U D D U | D P P U | D P P U | U D D U | U D D U |
| cutleaf evening-primrose | U U U U | N U U N | U U U U | N U U N | N U U N | U U U U | U U U U |
| dotted gayfeather | U U D U | U D P U | U U D U | U D P U | U D P U | U U D U | U U D U |
| ironplant goldenweed | U D D U | U P P U | U D D U | U P P U | U P P U | U D D U | U D D U |
| Louisiana sagewort | U U U U | U U D U | U U U U | U U D U | U U D U | U U U U | U U U U |
| narrowleaf penstemon | U D U U | U P P U | U D U U | U P P U | U P P U | U D U U | U D U U |
| plains bahia | N N N N | N U U N | N N N N | N U U N | N U U N | N N N N | N N N N |
| purple prairie clover | U P P D | U P P U | U P P D | U P P U | U P P U | U P P D | U P P D |
| scarlet gaura | U U D U | U D D U | U U D U | U D D U | U D D U | U U D U | U U D U |
| scarlet globemallow | U D D U | U P P U | U D D U | U P P U | U P P U | U D D U | U D D U |
| silky crazyweed | T T T T | T T T T | T T T T | T T T T | T T T T | T T T T | T T T T |
| silky sophora | T T T T | T T T T | T T T T | T T T T | T T T T | T T T T | T T T T |
| slimflower scurfpea | N N N N | N U U N | N N N N | N U U N | N U U N | N N N N | N N N N |
| wavyleaf thistle | U U D U | U D D U | U U D U | U D D U | U D D U | U U D U | U U D U |
| western ragweed | U D U U | U D U U | U D U U | U D U U | U D U U | U D U U | U D U U |
| woolly Indianwheat | U U U U | U U U U | U U U U | U U U U | U U U U | U U U U | U U U U |
| woolly locoweed | T T T T | T T T T | T T T T | T T T T | T T T T | T T T T | T T T T |
| Shrubs | | | | | | | |
| broom snakeweed | N N N N | N N N N | N N N N | N N N N | N N N N | N N N N | N N N N |
| fourwing saltbush | P D D P | P D D P | P D D P | P D D P | P D D P | P D D P | P D D P |
| fringed sagebrush | U N N U | U D D U | U N N U | U D D U | U D D U | U N N U | U N N U |
| plains pricklypear | N N N N | N N N N | N N N N | N N N N | N N N N | N N N N | N N N N |
| rubber rabbitbrush | N N N D | D D D D | N N N D | D D D D | D D D D | N N N D | N N N D |
| small soapweed | D P N D | D P N D | D P N D | D P N D | D P N D | D P N D | D P N D |
| winterfat | P P P P | P P P P | P P P P | P P P P | P P P P | P P P P | P P P P |

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

[†] Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions however, *continuous grazing is not recommended*. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, particularly when grazers other than cattle are involved. Under more intensive grazing management, improved harvest efficiencies can result in an increased carrying capacity.

| Plant Community | Production (lbs./acre) | Stocking Rate (AUM/acre) |
|--|---------------------------|--------------------------------|
| Western Wheatgrass, Blue Grama, Green Needlegrass, Fourwing (HCPC) | 1300 | 0.42 |
| Blue Grama/Buffalograss Sod w/Remnant Cool Seasons | 700 | 0.22 |
| Blue Grama/Buffalograss Sod | 600 | 0.19 |
| Low Plant Density, Excessive Litter | 850 | * |
| Red Threeawn, Annuals, Bare Ground | 100 | * |

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangelands in this area provide yearlong forage under prescribed grazing for cattle, sheep, horses and other herbivores. During the dormant period, livestock may need supplementation based on reliable forage analysis.

* Highly variable; stocking rate needs to be determined on site.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group A and B. Infiltration and runoff potential for this site varies from moderate to high depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where short grasses form a strong sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to NRCS Section 4, National Engineering Handbook (NEH-4) for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting, hiking, photography, bird watching and other opportunities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

No appreciable wood products are present on the site.

Other Products

None noted.

Supporting Information

Associated Sites

- (067BY024CO) – Sandy (formerly Sandy Plains)
- (067BY008CO) – Loamy Slopes
- (067BY036CO) – Overflow

Similar Sites

- (067BY009CO) – Siltstone Plains
[western wheatgrass, blue grama and green needlegrass are more productive]

Inventory Data References

Information presented here has been derived from NRCS clipping data, numerous ocular estimates and other inventory data. Field observations from experienced range trained personnel were used extensively to develop this ecological site description. Specific data information is contained in individual landowner/user case files and other files located in county NRCS field offices.

Those involved in developing this site description include: Harvey Sprock, Rangeland Management Specialist, NRCS; Ben Berlinger, Rangeland Management Specialist, NRCS; Chuck Ring, Rangeland Management Specialist, NRCS; Dave Cook, Rangeland Management Specialist, NRCS; Scott Woodall, Rangeland Management Specialist, NRCS; James Borchert, Soil Scientist, NRCS; Dave Sharman, Resource Conservationist, NRCS; Terri Skadeland, Biologist, NRCS.

State Correlation

This site is specific to Colorado (formerly Loamy Plains).

Field Offices

Akron, Brighton, Burlington, Byers, Cheyenne Wells, Eads, Flagler, Fort Collins, Fort Morgan, Greeley, Holly, Hugo, Kiowa, Lakewood, Lamar, Longmont, Simla, Springfield, Sterling

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (<http://hpccsun.unl.edu>)

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (<http://wcc.nrcs.usda.gov>)

USDA, NRCS. National Range and Pasture Handbook, September 1997

USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (<http://nasis.nrcs.usda.gov>)

USDA, NRCS. 2004. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Andrews, R. and R. Righter. 1992. Colorado Birds. Denver Museum Nat. Hist., Denver, CO. 442 pp.

Armstrong, D.M. 1972. Distribution of mammals in Colorado. Univ. Kansas Museum Nat. Hist. Monograph #3. 415 pp.

Colorado Breeding Bird Atlas. 1998. Hugh Kingery, Ed., Dist. CO Wildlife Heritage Found., P.O. Box 211512, Denver, CO, 80221. 636 pp.

Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. Mammals of Colorado. Denver Museum Nat. Hist. Denver, CO. 467 pp.

Hammerson, G.A. 1986. Amphibians and reptiles in Colorado. CO Div. Wild. Publication Code DOW-M-I-3-86. 131 pp.

Rennicke, J. 1990. Colorado Wildlife. Falcon Press, Helena and Billings, MT and CO Div. Wildlife, Denver CO. 138 pp.

Site Description Approval

/s/

03/25/2004

State Range Management Specialist

Date